REMARKS

Claims 49-51, 65 and 66 are currently pending in the application. Only claims 49 and 65 are in independent form.

Claim 49 stands objected to as being dependent upon a non-elected claim. Accordingly, in order to further prosecution, claim 49 has been re-written to be in independent form. Reconsideration of the objection is respectfully requested.

Claims 49-51, 65, and 66 stand rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The Office Action states that claims are drawn to a method of introducing a vector into cancerous cells, wherein the vector comprises a control sequence operatively linked to the nucleic acid sequence encoding protein phosphatase 2C α. The Office Action states that the specification teaches delivery of a vector to a cell in culture, but the specification is silent with respect to specific teachings of means to deliver the vector to a cancerous cell in a patient. Additionally, the Office Action states that the specification suggests that PP2Ca could be useful in the treatment of cancer because of its role in signaling pathways in a cell, however the specification fails to demonstrate any modification of PP2Ca expression associated with cancer.

However, when read more specifically, the specification teaches and sets forth results which support the methods of the present invention. These results establish that the expression of the enzyme PP2C is decreased in many types of cancer. This is specifically set forth on Page 10, lines 17-25, Examples 4 and 5 which span Pages 44, line 22 through Page 46, line 24. As set forth in the Office

Action on Page 4, the specification does teach one example of PP2Ca α expression in colorectal samples where quantitative PCR demonstrates that the level of PP2Ca in cancer cells is decreased relative to normal surrounding tissues, citing Example 5 in summarization in Figure 8. This establishes that PP2Ca is decreased in cancer cells relative to normal surrounding tissues. Thus, there is sufficient correlation established in the specification to show the modification of PP2Ca expression is associated with cancer in that PP2Ca is decreased relative to normal surrounding tissue samples compared to that in cancerous cells. The examples show the reversal of transformed phenotype in cancer cells infected with the virus from the adeno-associated viruses. Accordingly, there is sufficient support in the specification showing the correlation between PP2Ca expression modification and cancer.

The Office Action also states that in the absence of a clear relationship of PP2Ca expression in a cancer phenotype, that one of skill in the art would not know the proper levels of PP2Ca which would need to be expressed to effect any form of treatment. However, the specification as filed offers ample guidance for the selection and methods of using vectors. These include methods of controlling the outcome of administration of such a vector to a human subject as established on Page 16, line 6 through Page 21, line 15. The methods are also set forth in the Examples, see in particular Example 6, Page 23, line 26 through Page 24, line 4. Accordingly, there is support in the specification to establish what the proper levels of PP2Ca are required to effect a proper form of treatment.

Further, the Office Action states that the specification teaches human and mouse PP2Ca, however at the time of the claimed invention, there were many other PP2Ca cloned forms from other species, which are encompassed by the claims and it is unclear if the PP2Ca form from other species which are highly divergent in sequence homology, would be capable of complimenting the human and mouse forms of PP2Ca taught in the specification. However, the claims as

pending have been limited to mammalian forms of PP2Ca. Accordingly, reconsideration of the rejection is respectfully requested.

The Office Action states that the specification is silent with respect to any specific vector constructs or methodology for delivery of a vector to a patient which can be used for treatment of cancer in gene therapy protocols. However, as set forth previously, the specification does provide guidance for the selection and methods of using vectors which are encompassed by the methods of the present invention. These include methods of controlling the outcome of administration of such a vector to a human subject as set forth on Pages 16, line 6 through page 21, line 15 and as set forth in the Examples. Reconsideration of the rejection is respectfully requested.

Additionally, the Office Action states that, at the time the invention was made, successful implantation of gene therapy protocols was not routinely obtained by those of skill in the art. The Office Action cites two references from 1997 and 1998. However, there was sufficient knowledge prior to the filing of the present application in 1998, teaching the use of vectors and the successful targeted delivery of the vectors in a patient. Additionally, inducible gene expression has been established by series of articles, including Fukushige et al from 1992, Gage et al from 1992, Holt et al from 1993, all of which establish that genomic targeting of a vector can allow for highly reproducible gene expression in mammalian cells. Therefore, there is sufficient support in the prior art, available to those of skill in the art prior to the filing date of the present invention, of how to create induced gene expression through vector therapy. Additionally, the FDA has now approved an antisense drug for treating CMV infections in the eye. This utilized gene therapy. This also establishes that there is more specific detail, with regard to gene therapy, which is currently available and that those of skill in the art would view gene therapy as a reproducible and successful method of treatment. Accordingly, there is sufficient description both in the prior art and in the methods set forth in the

presently pending application which detail that the methods of the presently pending application are useful and reproducible in treatment. Accordingly, reconsideration of the rejection is respectfully requested.

Claims 49-51, 65, and 66 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

The Office Action states that claim 49 is unclear in the recitation of "further includes administrating" and in the recitation from claim 45 of "cells expressing the cancer." Claim 49 has been amended, thereby obviating the present rejection. Reconsideration of the rejection is respectfully requested.

Claim 51 and 66 stand rejected as being unclear in the recitation of "protein phosphatase 2C α" because claims 50 and 65 respectively are already restricted to protein phosphatase 2C α in the restriction requirement. In order to further prosecution, the claims have been cancelled without prejudice, thereby rendering the present rejection moot.

Claim 65, according to the Office Action is incomplete because it recited only administration of a vector and does not include a step where treatment is affected. Claim 65 has been amended to properly recite this relationship, and reconsideration of the rejection is respectfully requested.

Claims 50, 51, 65 and 66 according to the Office Action, are vague and unclear in the recitation of protein phosphatase 2C α because the specification teaches the use and characterization of human protein phosphatase α but does not teach the amino acid sequence nor polynucleotide sequences for the human protein phosphatase 2C α. In order to further prosecution, the claims have been

amended to more specifically define what is currently being claimed. Accordingly, reconsideration of the rejection is respectfully requested.

The Office Action states that should claim 50 be found allowable, claim 51 will be objected to as being a substantial duplicate thereof. Additionally, the Office Action states that if claim 65 is found allowable, claim 66 will be objected to as being a substantial duplicate thereof. However, as claims 51 and 66 have been cancelled without prejudice, this renders the present rejection moot. Reconsideration of the rejection is respectfully requested.

The remaining dependent claims not specifically discussed herein are ultimately dependent upon the independent claims. References as applied against these dependent claims do not make up for the deficiencies of those references as discussed above, the prior art references do not disclose the characterizing features of the independent claims discussed above. Hence, it is respectfully submitted that all of the pending claims are patentable over the prior art.

In view of the present amendment and foregoing remarks, reconsideration of the rejections and advancement of the case to issue are respectfully requested.

The Commissioner is authorized to charge any fee or credit any overpayment in connection with this communication to our Deposit Account No. 11-1449.

Respectfully submitted,

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231 on July 5, 2001.

Connie Herty

VERSION WITH MARKINGS TO SHOW CHANGES MADE

CLAIMS:

49. (Amended) [The] A method of [claim 45 wherein said] introducing mammalian protein phosphatase 2C into cancerous cells by determining the type of cancer and the cancerous cells and introducing [step further includes administering] the protein phosphatase into the cancerous cell by a vector.

50. (Amended) The method of claim 49 wherein the vector comprises an expression control sequence operatively linked to [the] a nucleic acid sequence of protein phosphatase 2C.

Please cancel claim 51.

65. (Amended) A method of treating cancer including the steps of

(a) determining the type of cancer and cells expressing the cancer;

(b) preparing a vector which will specifically target the cancer cells including regulatory elements to control the expressibility of a mammalian protein phosphatase 2C, and

(c) administering the vector to the patient for treating cancer.

Please cancel claim 66.